

MODEL : DN-9000
OVER LOAD LIMITER

User Manual



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1. Characteristics

Thank you for choosing our product. Please refer to the User Manual or contact us when you have any problem while you are using our product.

1-1. Mid-High Speed Changing Method

24bit high speed A/D changing equipment which could detect input signal of sensor at the speed of 1,000 times per second is being used.

1-2. Correction Method

Correction method as actual load (Standard load) has applied.

1-3. Output

The value of alarm & stop relay could be settled from the Key under over load, and the signal of contact point shall be output.

1-4. Data Back-up

Input data shall not be restored due to power failure, because all the setting values shall be stored on flash memory.

1-5. Watch dog

This is automatic reset function when the system has stopped by external causes such as noise and etc.

1-6. Option

As addition options, RS232C, RS485 and Analog output could be used.

1-7. Detection function for LOAD CELL LINE ERROR

Contact point of Buzzer and Relay shall be output when cable line of load cell is being disconnected.

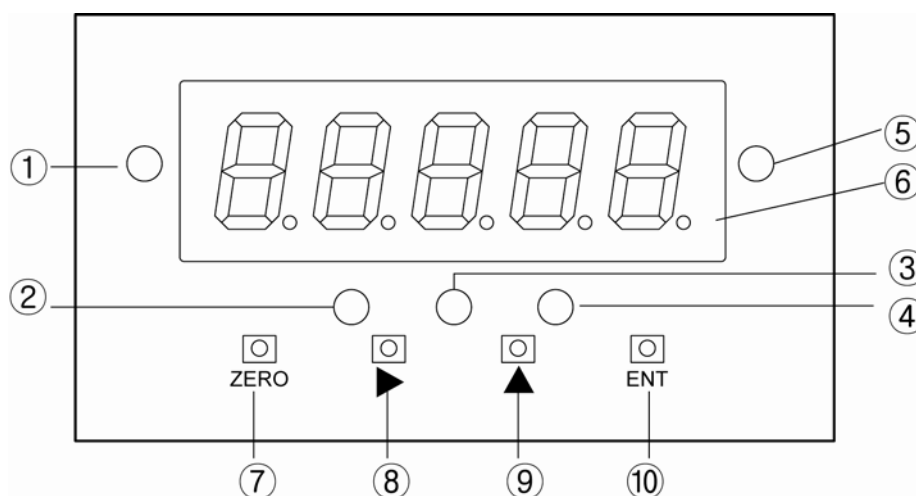
1-8. Power

The power is AC 85 ~ 265V 50/60Hz as Free voltage.

2. Specifications

- Usable Sensor : Strain gauge type sensor (Bridge 120Ω, 350Ω, 700Ω)
- Max. Indication : -19999 ~ +99999
- A/D Changer : 24bit, 1000 times/sec
- Temperature Characteristic (Amp Characteristic)
 - Zero : 0.5μV/℃
 - Span : 50ppm/℃
- Front Face Panel
 - Measuring Value Indication : 7 segment 5 Digit, Height of Letter 14mm
 - Status Indicating LED : Red LED 5 EA
 - Key Switch : 4 EA
- Output
 - Comparison Output : Output from RELAY1, RELAY2 and RELAY3
 - Contact Point Capacity AC 250V 5A
- Range of Using Temperature : -10℃ ~ 60, Under 82% RH (No freezing)
- Exterior Dimensions : 197 × 220 × 80 mm (W × H × D)
- Power : AC 85 ~ 265V, 50/60Hz free voltage
- Option : RS232C (OP-01), RS485 (OP-02), 4~20mA or 0~10V (OP-03)

3. Front Face Panel



- ① POWER : Power Indicating Lamp
- ② SET1 : RELAY1 Operation
- ③ SET2 : RELAY2 Operation
- ④ SET3 : RELAY3 Operation
- ⑤ TXD : Communication Status Lamp
- ⑥ Measuring Value Indication: It indicates measuring value and other values.
- ⑦ ZERO KEY

Measuring Mode: If you push the Key for over 3 seconds, the current value shall be changed as Zero.

Set Mode: If you push the Key on the function setting mode, the measuring mode shall be recovered.

- ⑧ ►

Measuring Mode: If you push the Key, the setting value of Relay is being shown and could be changed.

Set Mode: The line as location for flash figures shall be moved.

- ⑨ ▲

Measuring Mode: If you push the Key, the mode for actual load correction shall be operated.

Set Mode: The flash figure shall be increased by 1 figure (number).

- ⑩ ENT

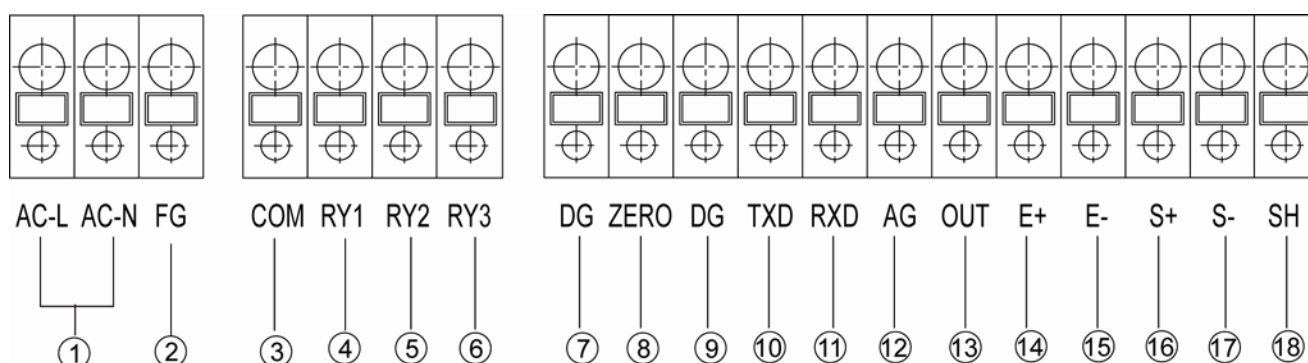
Measuring Mode: If you push the Key, the function mode shall be operated.


Set Mode: The setting value shall be saved.

4. Terminal Board

Please make sure of the location of terminal and its purpose, and then while you push the button on the terminal board, you could connect by putting the cable into the bottom hole. Please confirm the solid connection by pulling it out softly.

(In this case, the cable size of Φ 0.5~1 shall be reasonable, and please take lead welding or use one terminal for connecting cables in particular for several cable lines.)

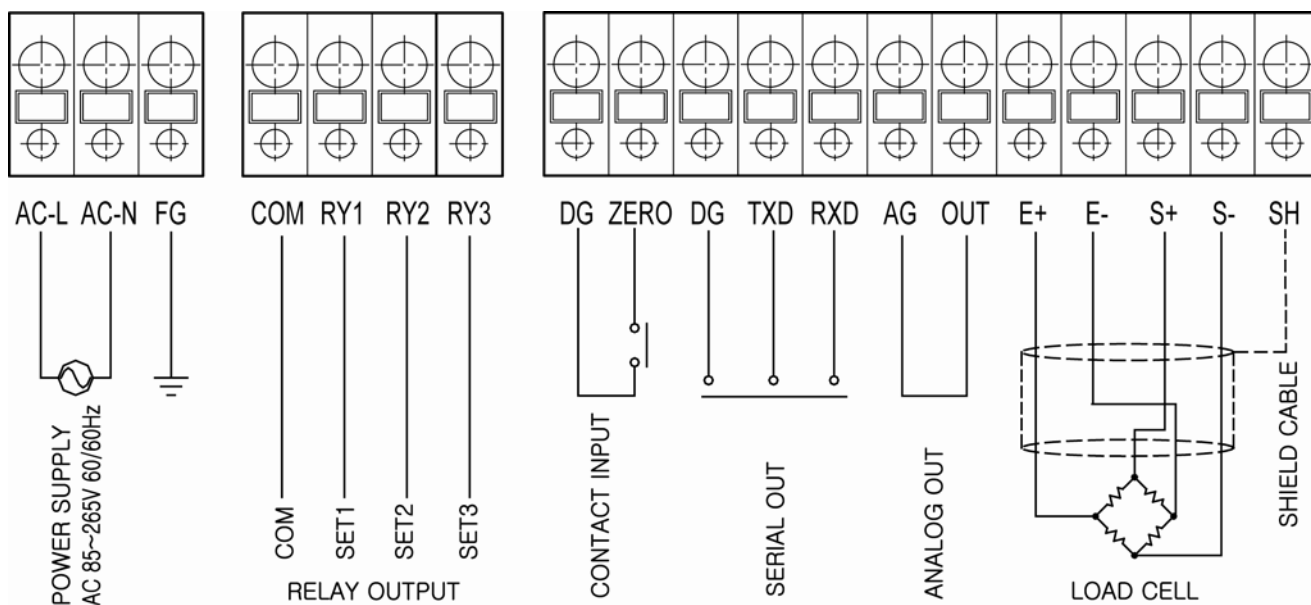


- ① AC IN : Power Cable Connection Terminal
- ②  : Earth Terminal (Please contact earth separately)
- ③ COM : RELAY output common terminal
- ④ RY1 : RELAY1 output terminal
- ⑤ RY2 : RELAY2 output terminal
- ⑥ RY3 : RELAY3 output terminal
- ⑦ DG : ZERO GND terminal
- ⑧ ZERO : ZERO input terminal
- ⑨ ~⑪ DG, TXD, RXD : RS232C SERIAL INTERFACE (RS485 : TXD → TX+, RXD → TX-).
- ⑫ AG : Analog output GND terminal
- ⑬ OUT : Analog output terminal (OP-03)
- ⑭ EXC+ : Sensor supply voltage + connection terminal
- ⑮ EXC- : Sensor supply voltage - connection terminal
- ⑯ SIG+ : Sensor output signal + connection terminal
- ⑰ SIG- : Sensor output signal - connection terminal
- ⑱ SH : SHIELD of Sensor connection terminal

◀ Notice ▶

1. Please plug the power out during the cabling.
2. The earth (⊕ terminal) shall be made by big size of cable to protect shock voltage or obstacle against surge, and the earth shall be made separately if possible.
(It shall be used in the place of high level of noise, and if the earth is being made with other machine, the noise will be affected.)
3. Please confirm the function of terminal and connect cables to protect failure of operation in advance.
4. In the event of accident which has made by intentionally disjoint and modification without consent of the Company, the responsibility shall be borne by the User and A/S shall not be made.

5. Cabling Draw

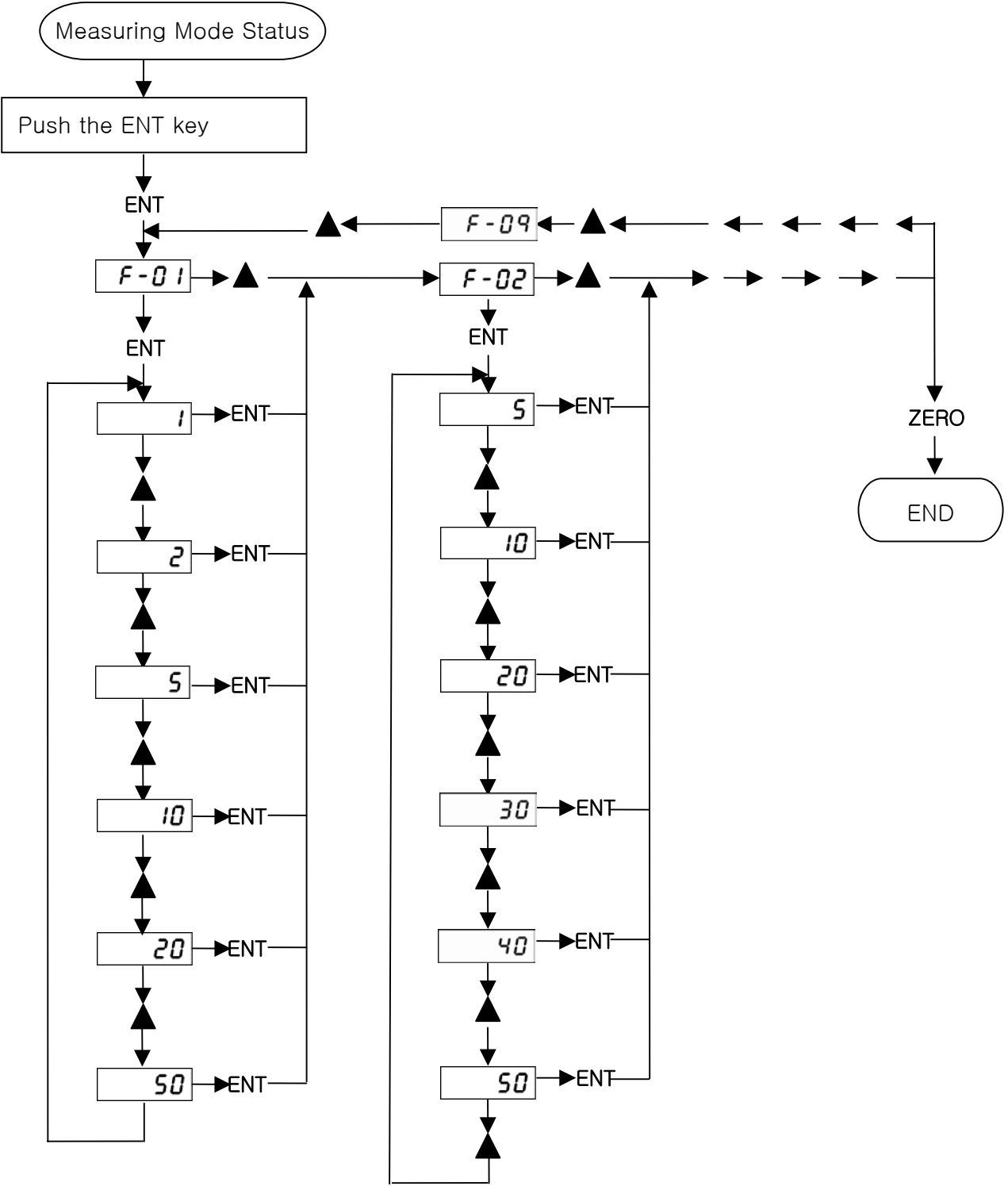


<Cabling Draw>

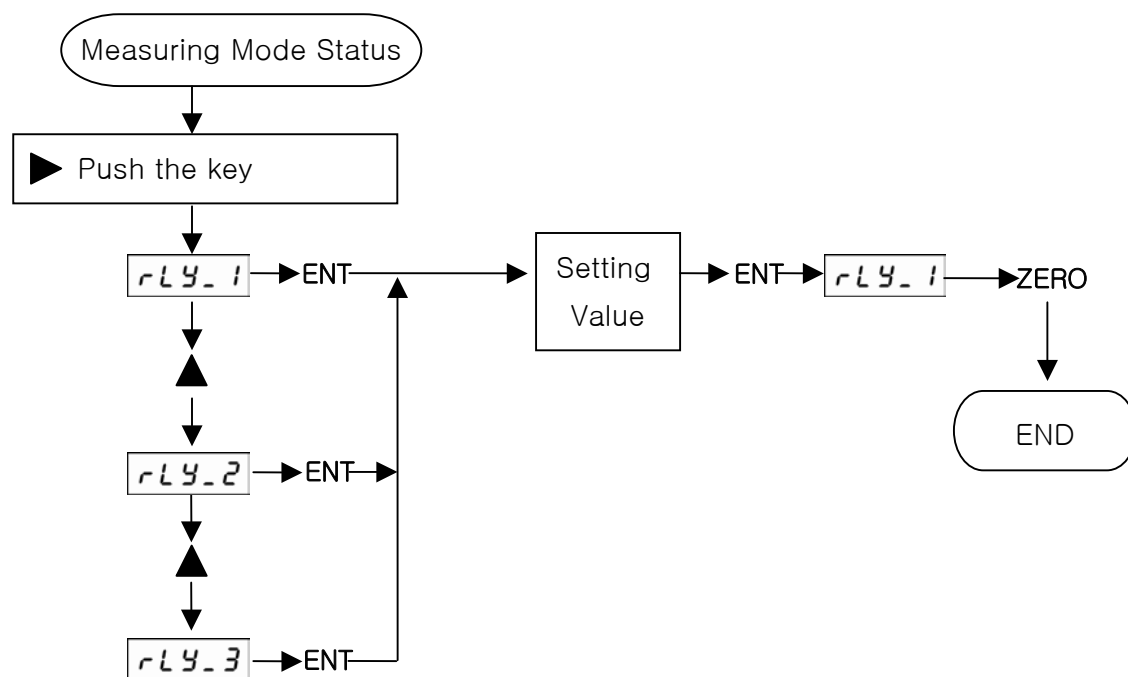
6. Setting Modes

6-1. Function mode (Function Setting)

1) Function setting method



2) RELAY Output Value Setting Method



rLY_1 → SET1 (RELAY1) Setting Value

rLY_2 → SET2 (RELAY2) Setting Value

rLY_3 → SET3 (RELAY3) Setting Value

Function mode list

| Name | Function | Setting | Standard Setting Value at Ex Work |
|------|--------------------|----------------------------------|-----------------------------------|
| F-01 | Division | 1, 2, 5, 10, 20, 50 | 1 |
| F-02 | Display filter | 5, 10, 20, 30, 40 | 5 |
| F-03 | Buzzer setting | 0, 1, 2, 3 | 0 |
| F-04 | Relay mode setting | A Contact Point, B Contact Point | 000 |
| F-05 | Relay Delay time | 0 ~ 9.9 sec | 0 |
| F-06 | DAC capacity | -19999 ~ +99999 (option) | 10000 |
| F-07 | ID Number | 0 ~ 32 | 0 |
| F-08 | Baud rate | 2400, 4800, 9600 | 9600 |
| F-09 | Pass word | 0 ~ 9999 | 0000 |

F-01. Division (Setting of Indication as Minimum Unit)

(Standard Setting Value: 1)

| Display data | Setting |
|--------------|--|
| 1 | Indicates as 1 unit (0, 1, 2, 3, 4) |
| 2 | Indicates as 2 unit (0, 2, 4, 6, 8) |
| 5 | Indicates as 5 unit (0, 5, 10, 15) |
| 10 | Indicates as 10 unit (0, 10, 20, 30) |
| 20 | Indicates as 20 unit (0, 20, 40, 60) |
| 50 | Indicates as 50 unit (0, 50, 100, 150) |

F-02. Display filter (표시 속도 설정)

(Standard Setting Value: 5)

| Display data | Setting |
|--------------|---|
| 5 | <div style="text-align: center;"> Speedy ↑ ↓ Slow </div> |
| 10 | |
| 20 | |
| 30 | |
| 40 | |

F-03. Buzzer setting mode

(Standard Setting Value: 0)

| Display data | Setting |
|--------------|----------------------------------|
| 0 | Not being interlocked with Relay |
| 1 | Being interlocked with Relay1 |
| 2 | Being interlocked with Relay2 |
| 3 | Being interlocked with Relay3 |

F-04. Relay mode setting mode

(Standard Setting Value: 000)

| Display data | Setting |
|--------------|---|
| 000 | Relay 1~3 A Contact point operation (N.O) |
| 001 | Relay 3 A Contact point operation (N.O) Relay1,Relay2 B Contact point operation (N.C) |
| 010 | Relay 2 A Contact point operation (N.O) Relay1,Relay3 B Contact point operation (N.C) |
| 100 | Relay 1 A Contact point operation (N.O) Relay2,Relay3 B Contact point operation (N.C) |

F-05. Relay Delay time mode

(Standard Setting Value: 00)

| Display data | Setting |
|----------------|--|
| 00 } 9.9 | 00 : N/A 0.1 ~ 9.9 : Unit as sec for setting of delayed time of output operation (0.1 sec ~9.9 sec) |

F-06. DAC capacity (Analog Output value Setting) (option)

(Standard Setting Value: 10000)

| Display data | Setting | | | | |
|-----------------------|---|-----------------------|--------|--------------------------|--------|
| -19999 } +99999 | Setting of rating capacity for analog output <Cases of Setting Value and Output> | | | | |
| | Setting Value | Voltage Output (±10V) | | Current Output (4 ~20mA) | |
| | | Indicating Value | Output | Indicating Value | Output |
| | +10000 | -10000 | -10V | -10000 | - |
| | | 0 | 0V | 0 | 4mA |
| | | +10000 | +10V | +10000 | 20mA |
| | -10000 | -10000 | +10V | -10000 | 20mA |
| | | 0 | 0V | 0 | 4mA |
| | | +10000 | -10V | +10000 | - |

F-07. ID Number (Number Setting for Communication Equipment)

(Standard Setting Value: 00)

| Display data | Setting |
|--------------|--|
| 00 | 00 : No setting of equipment number (Stream mode : always data transmission) |
| { 32 | 01 ~32 : Setting of equipment number (Command mode : Data transmission by command) |

F-8. Baud rate & Print (Communication speed and setting of print output)

(Standard Setting Value: 9600)

| Display data | Setting | Stream mode | Command mode |
|--------------|----------|-------------|--------------|
| 2400 | 2400 bps | O | O |
| 4800 | 4800 bps | O | O |
| 9600 | 9600 bps | O | O |

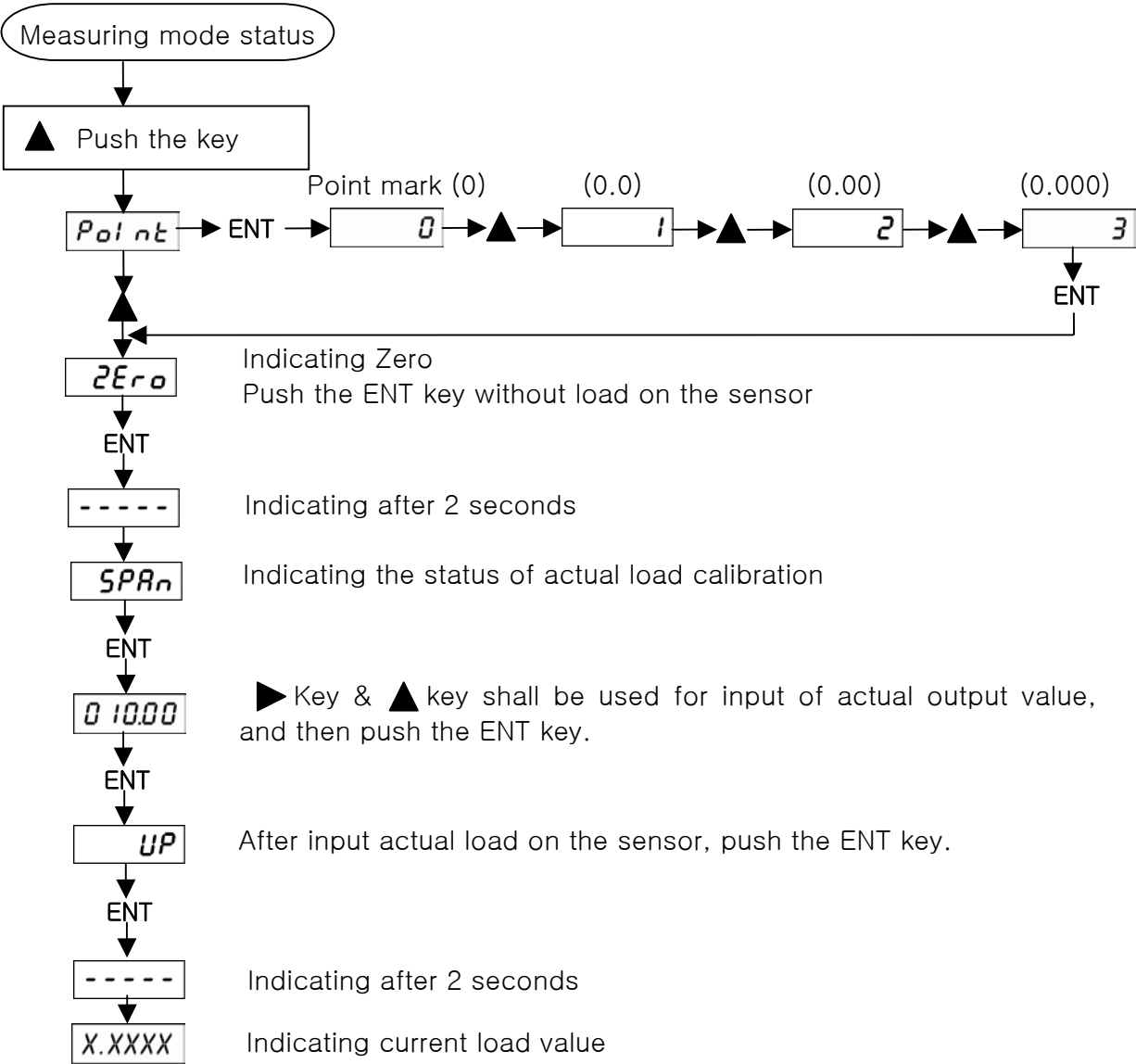
F-9. Pass word setting

(Standard Setting Value: 0000)

| Display data | Setting |
|--------------|-------------------------------------|
| 0000 | 0000 : No use pass word function. |
| { 9999 | 0001 ~9999 : Use pass word function |

- ※ If you set the pass word function, you should input pass word to get into the Relay setting, Actual load correction and Function mode.
But, Zero function may be used.

6-2. Actual load calibration



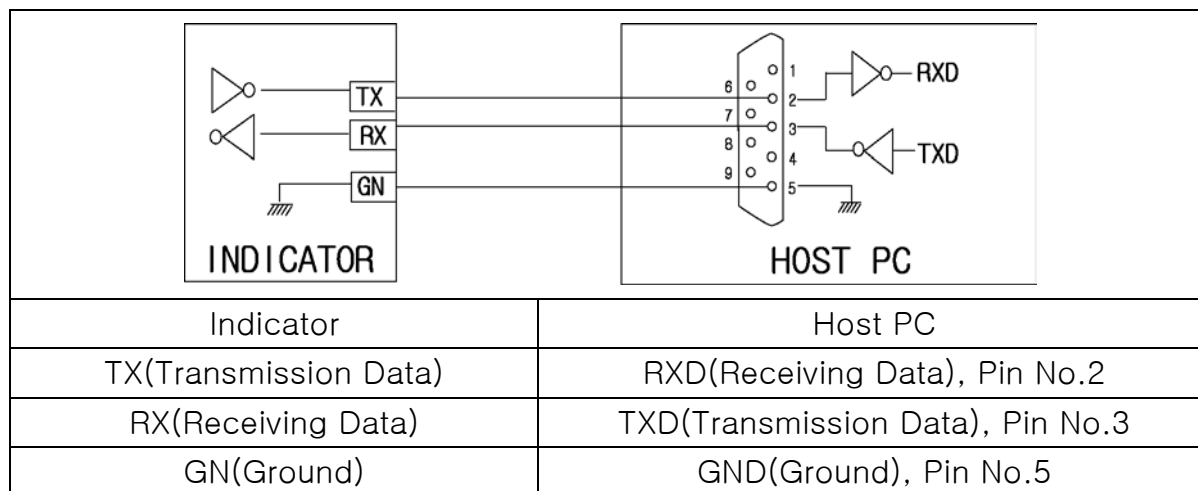
7. Product Inspection

| Defects | Causes | Corrections | Note |
|--|---|--|--|
| Trembling of Display | <ul style="list-style-type: none"> • Load cell Broken • Load cell insulation resistance • Interference | <ul style="list-style-type: none"> • Load cell input, output • Check resistance • Check load cell insulation resistance | <ul style="list-style-type: none"> • Insulation resistance (Cable & Case, Over 1000 Mohm) |
| When the weight is being increased or is not being returned to Zero. | • Defects of load cell | • Check loadcell insulation resistance | |
| | • Contact failure of load cell | <ul style="list-style-type: none"> • Check cable connection between loadcell and the body • Check disconnection of load cell cable | |
| The weight has changed to (–) | • Wrong cable connection of load cell | • Check connection of load cell output cable | • Output: (+SIG) (–SIG) |
| Indicated as “OVER” or “UNDER” | <ul style="list-style-type: none"> • Load cell damaged • Unstable connection of load cell | • Check status of load cell and cable connection | |

8. OPTION

#Option-02 (RS232C)

RS232C Interface shall be arranged as separated cabling from AC Power and electric cablings, because it is sensitive against electric noise. The cable shall be used as Shield Cable.



1. TYPE : EIA-232C
2. Method : Half duplex, Asynchronous type
3. Baud-rate : Selection of 2400, 4800, 9600bps
4. Parity : No Parity
5. Data bit : 8 bit
6. Stop bit : 1bit
7. Stream mode (Ex. Data +1234.5 Transmission)

| CODE | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 | BYTE8 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ASCII | S | T | , | N | T | , | + | 0 |
| HEX | 53H | 54H | 2CH | 4EH | 54H | 2CH | 2BH | 30H |

| CODE | BYTE9 | BYTE10 | BYTE11 | BYTE12 | BYTE13 | BYTE14 | BYTE15 | BYTE16 |
|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| ASCII | 1 | 2 | 3 | 4 | . | 5 | CR | LF |
| HEX | 31H | 32H | 33H | 34H | 2EH | 35H | 0DH | 0AH |

1) BYTE1, BYTE2

- . DATA Stable : S T . DATA Unstable: U S
- . DATA OVERFLOW: O L . DATA UNDERFLOW: U L

2) BYTE3 ~ BYTE6 : Fixed Letter (, N T ,)

- 3) BYTE7 ~ BYTE14 : DATA 8 BYTE(+/- included)
- 4) BYTE15 : CARRIAGE RETURN
- 5) BYTE16 : LINE FEED

8. Command mode

OP-03 : Refer to RS485

#Option-03 (RS485)

RS485 Interface shall be arranged as separated cabling from AC Power and electric cablings, because it is sensitive against electric noise. The cable shall be used as Shield Cable.

1. TYPE : RS485
2. Method : Half duplex, Asynchronous type
3. Baud-rate : Selection of 2400, 4800, 9600bps
4. Parity : No Parity
5. Data bit : 8 bit
6. Stop bit : 1bit

Please set the number of equipment referring to INDICATOR Manual.
(Possible to set for 1 ~ 32 channel)

7. Command Type (PC → INDICATOR)

| CODE | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 |
|-------|-------|-------|-------|-------|-------|
| ASCII | I | D | 0 | 1 | P |
| HEX | 49H | 44H | 30H | 31H | 50H |

- 1) BYTE1, BYTE2 : Fixed Letter (ID)
- 2) BYTE3, BYTE4 : Equipment Number (1 ~ 32)
- 3) BYTE5 : Order command (P, Z)

8. Command Table

| Command | | Command Descriptions |
|---------|-----|--|
| ASCII | HEX | |
| P | 50H | Transmission of current value of commanded equipment |
| Z | 5AH | Operate the current value of commanded equipment as ZERO |

9. Transmission DATA Type (INDICATOR → PC)

| CODE | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 | BYTE8 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ASCII | I | D | 0 | 0 | 1 | , | + | 0 |
| HEX | 53H | 54H | 30H | 30H | 31H | 2CH | 2BH | 30H |

| CODE | BYTE9 | BYTE10 | BYTE11 | BYTE12 | BYTE13 | BYTE14 | BYTE15 | BYTE16 |
|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| ASCII | 1 | 2 | 3 | 4 | . | 5 | CR | LF |
| HEX | 31H | 32H | 33H | 34H | 2EH | 35H | 0DH | 0AH |

- 1) BYTE1, BYTE2 : Fixed Letter (ID)
- 2) BYTE3 ~ BYTE5 : Equipment Number (1 ~ 32)
- 3) BYTE6 : Fixed Letter (,)
- 4) BYTE7~BYTE14 : DATA 8byte (+/- included)
- 5) BYTE15 : CARRIAGE RETURN
- 6) BYTE16 : LINE FEED